

CLAIMS

1. A system for use with a broadband network, the system comprising:
a network-metrics apparatus configured to obtain first metrics of performance of
5 at least a portion of the broadband network;
a data-processing apparatus coupled to the network-metrics apparatus and
configured to combine a plurality of first metrics into a second metric of network
performance indicative of a higher-level of network performance than indicated by the
first metrics; and
10 a data-arranging apparatus coupled to the data-processing apparatus and
configured to arrange at least a portion of the first metrics and the second metric into a
predetermined format.
2. The system of claim 1 wherein the first metrics are indicative of different
15 network performance issues.
3. The system of claim 2 wherein the second metric is generic to the different
network performance issues of the first metrics, and wherein the combiner is configured
to combine another plurality of first metrics into another second metric and to combine
20 the second metric and the another second metric into a third metric that is generic to the
second metric and the another second metric.
4. The system of claim 3 wherein the data-processing apparatus is configured

to combine the first and second metrics in accordance with a topology of the network associated with the first and second metrics, respectively, wherein the data-processing apparatus is further configured to determine a plurality of third metrics and to combine the third metrics in accordance with a topology of the network associated with the third
5 metrics.

5. The system of claim 1 wherein the data-processing apparatus is configured to combine the first metrics in accordance with a topology of the network associated with the first metrics.

10 6. The system of claim 5 wherein the data-processing apparatus is configured to combine the first metrics of a selected portion of the network, the selected portion being less than all of the network.

15 7. The system of claim 1 wherein the first metrics are indicative of performance of the least a portion of the broadband network over time.

8. The system of claim 1 wherein the at least a portion of the broadband network is a selected portion of the broadband network, the selected portion being less
20 than all of the network.

9. The system of claim 1 wherein the data-arranging apparatus is configured to graph at least one of the metrics over a length of time.

10. The system of claim 1 wherein the data-processing apparatus is configured to weight the first metrics differently in combining the first metrics.

5 11. The system of claim 10 wherein different weights applied to different first metrics are dependent upon at least one of perceived priority of the different first metrics and perceived impact of the different first metrics on network performance.

12. The system of claim 1 wherein the data-processing apparatus is configured
10 to collect raw data associated with network performance and to normalize the raw data to obtain the first metrics.

13. The system of claim 1 wherein the network-metrics apparatus, the data-
processing apparatus, and the data-arranging apparatus each comprise computer-
15 executable instructions configured to cause a computer to process data.

14. The system of claim 1 wherein the network-metrics apparatus is
configured to obtain the first metrics by collecting raw data from the network, and
comparing the raw data against thresholds indicative of levels of performance of the
20 network.

15. The system of claim 14 wherein the network is a DOCSIS network
including cable modems and cable modem termination systems, and the first metrics

indicate numbers of cable-modem hours at the levels of performance of the network.

16. A system for use with a broadband network, the system comprising:
a collector configured to collect raw data, indicative of network operation, from
5 the network;

first-metric determining means, coupled to the collector, for receiving the raw
data from the collector, manipulating the raw data to periodically determine first metrics
based on the raw data, the first metrics being indicative of a plurality of levels of network
performance, and being associated with a time period; and

10 combining means, coupled to the determining means, for combining the first
metrics, according to network topology and network characteristics associated with the
first metrics, into time-dependent second metrics indicative of at least amounts of time
that the associated network characteristics were at corresponding ones of the plurality of
levels of network performance.

15 17. The system of claim 16 wherein the combining means combines the
metrics into a hierarchy of combinations of metrics, including at least third metrics
resulting from combinations of second metrics, the hierarchy being arranged according to
network performance characteristic.

20 18. The system of claim 17 wherein the hierarchy of combinations of metrics
includes a summary of performance, in terms amounts of time that associated network
characteristics were at corresponding ones of the plurality of levels of network

performance, of at least one of a selected portion of the network and the network, the hierarchy further comprising sub-metrics of network characteristics contributing to the summary, and sub-sub-metrics of network characteristics contributing to the sub-metrics.

5 19. The system of claim 17 wherein the second and third metrics are indicative of sums of amounts of time that the associated network characteristics were at corresponding ones of the plurality of levels of network performance for network elements associated with the network characteristics.

10 20. The system of claim 16 wherein the of levels network performance are at least degradation in the degraded and severely degraded degrees, major issues under that, and direct and indirect contributors to the major issues.

15 21. The system of claim 16 wherein the first-metric determining means and the combining means are configured to be disposed in a node connected to at least a portion of the network.

20 22. The system of claim 16 wherein manipulating the raw data includes comparing data related to the raw data against predetermined thresholds, the thresholds being indicative of breaking points between acceptable and degraded performance of a network issue related to the raw data and degraded and severely degraded performance of the related network issue.

23. The system of claim 16 wherein the first-metric determining means is configured to determine the first metrics in substantially real time.

24. The system of claim 16 wherein the second metrics are indicative of degraded network element hours and severely-degraded network element hours.

25. A computer program product for consolidating broadband network performance and comprising computer-executable instructions for causing a computer to:

periodically collect network activity data for elements of a broadband network;

10 use the network activity data to determine amounts of time that the network elements are degraded for a plurality of network issues;

combine the amounts of time that the network elements are degraded according to the network issues and according to network topology to determine cumulative amounts of time of degraded network element performance for the plurality of issues;

15 combine cumulative amounts of time of associated issues into cumulative amounts of time for groups of related issues; and

combine cumulative amounts of time for groups of related issues to determine at least one summary amount of time of degraded performance of network elements in the network.

20 26. The computer program product of claim 25 wherein the cumulative amounts and the summary amount comprise individual values associated with each of at least one level of network degradation regardless of a number of network elements associated with the individual values.